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sity; J. T. Rorer, Central High School, Philadelphia; Arthur Schultze, High School of Commerce, New York; H. C. Whitaker.

Central Association of Science and Mathematics Teachers.—Otis W. Caldwell; Jos. V. Collins; C. E. Comstock; G. W. Greenwood; Charles H. Smith; Charles M. Turton; J. W. Young, Charles W. Wright.

Missouri Society of Teachers of Mathematics.—F. T. Appleby; J. S. Bryan, Central High School, St. Louis; H. Clay Harvey; E. R. Hedrick; B. F. Johnston; John R. Kirk; J. W. Whiteye.

Chicago and Cook County High School Teachers' Association.—Edward E. Hill; Fred R. Nichols; Charles M. Turton.

Mathematical Section of Michigan School-Masters' Club.—Miss Emma C. Ackermann.

New York State Science Association, Mathematical Department.—Glenn M. Lee.

North Eastern Ohio Center, G. A. S. and M. T.—Lemar T. Beman, Cleveland High School; Charles A. Marple.

Ohio Association of Teachers of Mathematics and Science.—Franklin T. Jones; Wm. McLair.

St. Louis Association of Science and Mathematics Teachers.—Wm. Schuyler, McKinley High School, St. Louis.

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BOOKS

A College Algebra. By Henry Burchard Fine, Professor of Mathematics in Princeton University. viii+595 pages, Cloth. Boston, New York, Chicago, and London: Ginn & Co.

Those who have read Professor Fine's *The Number System of Algebra* will expectantly turn, in this volume, to part first, entitled, Numbers. Their anticipations will be fully met. Under the influence of the Cantor-Dedekind school of thought recent years have shown remarkable advancement of the theory of irrationals and of cardinal number. The elements of this theory lie at the basis of algebra and we have here, we believe, for the first time, a teachable treatise based on these fundamental concepts.

The treatment of the usual subject-matter of college algebra is also admirable. Special features of the text are, short chapters on Interpolation, on Variation, and on Probability, and a moderately long treatment of the elements of the theory of equations. The work ends with a rigid proof of the existence theorem of algebra.

The author has given little space to special devices but seeks "to assist the student to really master the general methods of the science," and the logical interrelations which connect its parts. The work is in every sense a classic. G.

Elements of Descriptive Geometry. By Chas. E. Ferris, Professor of Mechanical Engineering in the University of Tennessee. Cloth, 8vo, 135 pages. New York, Cincinnati, Chicago: American Book Co.

The author follows the custom of most draftsmen and does all his work in the third quadrant. The exercises are well graded and the illustrative drawings are plentiful and well executed. The first six chapters treat the usual subject matter of the subject. Chapter VII is on Warped Surfaces; Chapter VIII treats the subject of Shades and Shadows, and Chapter IX is devoted to a brief treatment of Perspective. G.

The Elements of Geometry. By Walter N. Bush and John B. Clarke, of the Polytechnic High School of San Francisco. 355 pages. Price, $1.25. Chicago, Boston, New York: Silver, Burdett & Co.

On page 255 of his book entitled "The Teaching of Elementary Mathematics" Professor David Eugene Smith of Columbia University gives the following criteria for a usable text-book in Geometry, viz:

1st. A sequence of propositions which is not only logical, but psychological;

2nd. Exact statements;

3rd. Proofs which are models of excellence for the pupil to pattern after;

4th. Abundant exercises from the beginning with practical suggestions to methods of attacking them.

Judged by this standard "The Elements of Geometry" by Bush and Clarke should prove a very successful book. The sequence of propositions is a logical one; cognate theorems are put in special groups or classes. The merit of the arrangement from the psychological point of view has been tested by the authors during the many years they have devoted to the preparation of the work. The statements and definitions are accurate and clear. In the proofs the hypothesis and conclusion are carefully separated, thus not only making the path easier for the student, but also giving him a standard for the presentation of his solution of "originals." The exercises are both numerous and well selected.

The authors are to be commended for arranging the proofs so that it should not be necessary to turn the page and then have to turn back for the figure. As in all modern texts, the diagrams are carefully prepared and are very good. An excellent index at the end enables one to find easily any desired place. ALMA E. KLUNDER.

Biology and Mathematics. By George Bruce Halsted. 15 pages. An address delivered before Section A of the American Association for the Advancement of Science, Philadelphia, December 29, 1904. Reprinted from *Science*, N. S., Vol. XXII, No. 554, pages 161-167, August 11, 1905.

Professor Halsted discusses with great force and insight the analogies between the Darwinian theory of variation and the continuous variable, on the one hand, and the more recent theory of mutation and discontinuous variation, on the other. F.

ERRATA.

Equation (3) on page 122 should read,

$$x=\frac{p}{3c}\left[\frac{F'(0)+F'(p)}{2}+F'\left(\frac{p}{3}\right)+F'\left(\frac{2p}{3}\right)\right]-\frac{p^2}{108c}\left[F''(p)-F''(0)\right]\ldots\ldots\ldots(3).$$

Line 10 from bottom, on page 134, should read,

$$\begin{aligned}2S&=\frac{1}{2.3.4}+\frac{1}{5.6.7}+\frac{1}{8.9.10}+\ldots\ldots\ldots\\&=\tfrac{1}{2}-\tfrac{2}{3}+\tfrac{1}{4}\\&\qquad+\tfrac{1}{3}-\tfrac{2}{4}+\tfrac{1}{5}\\&\qquad\qquad+\tfrac{1}{4}-\tfrac{2}{5}+\tfrac{1}{6}\\&\qquad\qquad\quad\vdots\quad\;\vdots\quad\;\vdots\\&=\tfrac{1}{2}-\tfrac{1}{3}=\tfrac{1}{6}.\end{aligned}$$